TABLE NO | | | |

STUDENT ID NO | | | | | | | | | | |

MULTIMEDIA UNIVERSITY

SUBJECT CODE _____

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

TSE3351/TSE3571 – SOFTWARE EVOLUTION AND MAINTENANCE

(All sections / Groups)

23 OCTOBER 2018
2:30 pm – 4:30 pm
(2 Hours)

Question	Mark
1	
2	
3	
4	
5	
Total	

Examiner 1 Signature: _____

Examiner 2 Signature: _____

Examiner 3 Signature: _____

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 11 printed pages (including cover page) with **5 Questions** only.

2. Attempt **ALL** questions. The distribution of the marks for each question is given.

3. Please write all your answers **CLEARLY** in the specific answer box provided for each question. Submit this question paper at the end of the examination.

Question 1 (10 Marks)

The ST cloud computing is a network of virtual machines that has no fixed location and can only accessed remotely. Although many continue to use a desktop PC (personal computer) to access ST cloud-based data and applications, software maintainers often rely on their smart-phones, tablets, and other mobile devices.

A service-level agreement (SLA) is an agreement between two or more parties, where one is the cloud user (client) and the others are cloud service providers. This can be a legally binding formal or an informal "contract" (for example, internal department relationships). The underlying benefit of cloud computing is shared resources, which is supported by the underlying nature of a shared infrastructure environment.

The efficiency and performance of ST cloud-based services could be improved by moving deployment decisions up the development chain. In addition, resource-aware services could give the client better control of resource usage and thereby comply with SLAs more inexpensively.

(a). You are appointed as the software maintainer of this ST system. Discuss **FIVE (5)** the issues that can contribute to high maintenance costs. What steps would you take to minimize the effects of high maintenance costs?

(5 Marks)

Continued...

(b). Referring to your solution in Q1 (a), what are the **TWO (2)** factors that can affect the maintenance personnel to acquire the necessary knowledge for maintaining the above-mentioned system?

(2 Marks)

(c). Explain the following software product attributes:

i. Maintenance **(1 Mark)**
ii. Maintainability **(1 Mark)**
iii. Software Maintenance **(1 Mark)**

Continued...

Question 2 (10 Marks)

The ST system deploys many inexpensive network-connected sensors. The solution works by aggregating distributed data from each sensor into a cloud-based database. Subscribers to the data can use visualization and analytics to monitor and react to current conditions as well as predict future energy production.

The ST system focuses on the ability to capture and analyze large amounts of solar raw data. Its success will rely on the deployment of a large number of network-connected sensors.

(a). Explain **TWO (2)** reasons why configuration management in software development differs from configuration management in software maintenance for the above-mentioned ST system.

(5 Marks)

Continued...

(b) What comprises a good test plan for an assessment using ST system? Explain **FOUR (4)** ways how a good test plan facilitates testing for the ST system.

(1 + 4 Marks)

Continued...

Question 3 (10 Marks)

Preventive maintenance should also include a regular inspection of the software system by an outside expert. The smaller firm has limited expertise. Minor programming is usually done part-time by someone with other areas of responsibility. The structure and integrity of disk files should be inspected. File usage must be estimated and projected into the next few months. The consultant should verify the proper performance of back-up procedures.

(a). What are **THREE (3)** common justifications for not doing preventive Maintenance by the small firms?

(6 Marks)

Continued...

(b). Explain why it is important to conduct program comprehension before impact analysis.

(4 Marks)

Continued...

Question 4 (10 Marks)

Free and Open Source Software (FOSS) development has emerged as one of the more important Information Technology (IT) trends in this century. Recently, software industries including Government organizations adopted FOSS for building their software-based infrastructure for various reasons. Today, individual programmers, Government and many of the IT firms are lining up towards FOSS and are adopting open source software for building their custom products.

(a). Discuss the **THREE (3)** differences in details between Free and open source software (FOSS) and Closed Source Software (CSS) software evolution system based on the scenario above.

(6 Marks)

Continued...

(b) Explain the **TWO (2)** differences between the incremental and the iterative development models?

(4 Marks)

Continued...

Question 5 (10 Marks)

Case 1
A bank's customer service team discovers that customers are accidentally paying the wrong bill. The business team responsible for the site investigates and finds that two companies have similar descriptions and billing account formats. They submit a change request that the merchant descriptions be changed in the database reference table to make a clear distinction between the two companies.

Case 2
An air conditioner manufacturer is in the middle of a product development project when they realize that a new air purification function can't be controlled properly from the remote-control unit. They submit a change request to include new buttons on the remote control.

Case 3
A train manufacturer determines that a procedure for tuning brakes is incorrect and leads to malfunctions. They issue an urgent communication to maintenance teams and submit a change request to update the procedure in equipment manuals.

(a). Based on the above three cases, discuss **FIVE (5)** of the factors that you would think about when reviewing a change request (CR)?

(5 Marks)

Continued...

(b) Explain **FOUR (4)** difficulties that you would expect in the context of software reuse.

(2 marks)

(c) Provide **SIX (6)** benefits that can be derived from software reuse.

(3 marks)

End of Paper